

## CLAIMS:

1. A device for dynamic impedance matching between a power amplifier and an antenna, having

a circulator (210), which routes a signal received from the power amplifier (10) at a first port via a second port to the antenna (30) and diverts the signal reflected at the antenna (30) and received at the second port through a third port; and

a matching network (24, 240, 250);

characterized in that a directional coupler (200) diverts a proportion of the signal traveling from the power amplifier (10) to the antenna (30), from which the magnitude and phase of the signal may be derived, to a signal detector (220); and

the circulator (210) routes the entire signal reflected at the antenna (30) into the signal detector (220);

wherein the signal detector (220) passes the magnitude and phase of both the signal traveling to the antenna (30) and the signal reflected at the antenna (30) to a controller (230), which evaluates the information received from the signal detector (220) in order to determine the present impedance value of the antenna (30) and to correct the controllable matching network (24, 240, 250) containing active and passive components in accordance with the determined impedance value of the antenna (30).

2. A device as claimed in claim 1, characterized in that at least the directional coupler (200), the circulator (210), the signal detector (220) and the controller (230) are arranged immediately downstream of the power amplifier (10).

3. A device as claimed in claim 1 or 2, characterized in that the controllable matching network (24) is arranged immediately upstream of the antenna (30).

4. A device as claimed in claim 1 or 2, characterized in that the directional coupler (200), the circulator (210), the signal detector (220) and the controller together with the controllable matching network (240, 250) take the form of a module (20) and are arranged immediately downstream of the power amplifier (10).

5. A device as claimed in any one of claims 1 to 4, characterized in that the active components (240) of the controllable matching network comprise varactor diodes, MEM switches and the like.

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6. A device as claimed in any one of claims 1 to 5, characterized in that the directional coupler (200), the circulator (210) and the passive components (250) of the controllable matching network are integrated into an LTCC substrate (260).

10 7. A device as claimed in any one of claims 1 to 6, characterized in that the signal detector (220), the controller (230) and the active components (240) of the controllable matching network are integrated into a semiconductor chip (270).

15 8. A communications apparatus, in particular a cell phone, having a device for dynamic impedance matching between a power amplifier and an antenna as claimed in any one of claims 1 to 7.

9. A method for dynamic impedance matching between a power amplifier and an antenna,

20 characterized in that the magnitude and phase of both the signal traveling to the antenna (30) and the entire signal reflected at the antenna (30) are evaluated, in order to determine the present impedance value of the antenna (30); and

a controllable matching network (24, 240, 250) having active and passive components is corrected in accordance with the determined impedance value of the antenna  
25 (30).